I claim:

4. A semiconductor chip carrier comprising:

a primary substrate;

a metal heat sink plate having a first side and an opposing second side where said primary substrate is attached to said first side; and a supplemental substrate attached to said metal heat sink plate on said second

side.

- 10 2. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate is constructed from a material having substantially similar coefficient of thermal expansion as said primary substrate.
- 3. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate is constructed from a same material as said primary substrate.
 - 4. A semiconductor chip carrier according to claim 1, wherein said primary substrate is constructed from a material selected from one of Bis-malesimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.

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- 5. A semiconductor chip carrier according to claim 1, wherein said primary substrate is a ball-grid array/chip carrier.
- 6. A semiconductor chip carrier according to claim 1, wherein said metal heat sink plate is a metal selected from one of Cu, Cu-W, Al and alloys thereof.
 - 7. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate has a Cu-Ni finish layer.
- 8. A semiconductor chip carrier according to claim 1, wherein said supplemental substrate has a cavity exposing a portion of said metal heat sink plate.

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A semiconductor chip carrier comprising:
 a primary substrate;

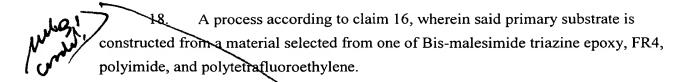
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a metal heat sink plate having a first side and an opposing second side where said primary substrate is attached to said first side; and

a supplemental substrate being attached to said second side of said metal heat sink plate, wherein said supplemental substrate is constructed from a material having a substantially similar coefficient of thermal expansion as said primary substrate.

10. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate is constructed from a same material as said primary substrate.

- 10 11. A semiconductor chip carrier according to claim 9, wherein said primary substrate is constructed from a material selected from one of Bis-malesimide triazine epoxy, FR4, polyimide, and polytetrafluoroethylene.
- 12. A semiconductor chip carrier according to claim 9, wherein said chip carrier 15 is a ball-grid array chip carrier.
 - 13. A semiconductor chip carrier according to claim 9, wherein said metal heat sink plate consists of a metal selected from one of Cu, Cu-W, Al, and alloys thereof.
- 20 14. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a Cu-Ni finish layer.
 - 15. A semiconductor chip carrier according to claim 9, wherein said supplemental substrate has a cavity exposing a portion of said metal heat sink plate.
 - 16. A method of forming a semiconductor chip carrier, comprising:
 providing a metal heat sink plate having a first side and an opposing second side;
- attaching a primary substrate to said first side; and
 attaching a supplemental substrate to said second side of said metal heat sink
 plate, wherein said supplemental substrate is constructed from a material having
 - substantially similar coefficient of thermal expansion as said primary substrate.
- 17. A process according to claim 16, wherein said supplemental substrate is constructed from a same material as said primary substrate.



5 19. A process according to claim 16, wherein said chip carrier is a ball-grid array chip carrier.

and as

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